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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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EXAMINER

SURGEON

ART UNIT

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/079,850

Applicant(s)
Genov et al.

Examiner
Brian Sircus

Group Art Unit
2837



☒ Responsive to communication(s) filed on Dec 21, 1998

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-7, 15-19, 31, 35, 39, and 44-50 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-7, 15-19, 31, 35, 39, 46, 47, 49, and 50 is/are rejected.

☒ Claim(s) 44, 45, and 48 is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been
☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☐ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3,6

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3, 49 and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. (4,488,242) in view of Ueyama et al. (5,571,325). Tabata et al. discloses a robot controller that moves a two joint robot in off-axis linear motions and uses a optical position detection to aid in control. Tabata et al. does not disclose use of an end effector. Ueyama et al. discloses a plural robotic controller device used to move substrates to and from various positions that uses end effectors to grasp and move the substrates (figs 12,14) and in which yaw of the end effector is controlled to provide linear movement. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Tabata et al. to use an end effector because Ueyama et al. teaches that using end effectors allows the robot to perform a task, which is a desirable feature when the robot is used in a manufacturing environment.

Claims 4, 6, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. and Ueyama et al. as applied to claim 1 above, and further in view of Nishida et al. (4,680,802). Tabata et al. discloses a robot controller that may be modified according to the teachings of Ueyama et al. to use an end effector but neither of these references disclose using the robot in conjunction with a conveyor. Nishida et al. discloses a robotic system that uses a

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conveyor belt. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the controller of Tabata et al. to use a conveyor because Nishida et al. teaches that this is a good system for positioning work pieces in a location in which the robot may access them.

Claims 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. and Ueyama et al. as applied to claim 1 above, and further in view of Tateyama et al. (5,202,716). Tabata et al. discloses a robot controller that may be modified according to the teachings of Ueyama et al. to use an end effector but neither of these references disclose a waiting section located between two robot stations. Tateyama et al. discloses a wafer processing device in which two separate robot arms exchange wafers at a waiting section accessible to both robots.

Claims 15-17, 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyama et al. and Herzog (4,961,267) and Tabata et al. Ueyama et al. discloses a wafer processing device that uses multiple end effectors to move wafers about but does not disclose using two dual link connectors to move the end effector. Herzog discloses a device for moving an end effector (fig3a) which uses two links to move the end effector about and the links each are r, theta type joints. Tabata et al. discloses an r, theta joint that uses rotary connectors. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Ueyama et al. to use multiple r, theta joints and to use angle r, theta joints because two joints as taught in Herzog provides redundancy and multiple angle joints as taught in Tabata et al. provide modularity (eg. ease of replacement).

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Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ueyama et al. and Herzog and Tabata et al. and Genov et al. (5,064,340). Ueyama et al. discloses a wafer processing apparatus that may be modified according to the teachings of Herzog and Tabata et al. to provide two dual jointed rotary connectors to position the end effector as discussed above but none of these references disclose using belts to transmit motion to a rotary axis. Genov et al. discloses a robotic arm that performs positioning control that locates the motors at one central location and drives each rotary joint via belts. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have further modified the apparatus of Ueyama et al. to use belts because Genov et al. teaches that locating the motors at a extreme points creates heavier loads on extreme joints while moving the motors closer to the primary joint reduces the loads on the joints.

Claims 31, 35, 39, 46 and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabata et al. in view of Ueyama et al., and Corwin, Jr et al. Tabata et al. discloses a positioning apparatus that may be modified to provide an end effector as taught by Ueyama et al. and discussed above but neither of these references disclose multiple motion end effectors. Corwin, Jr. et al. discloses an end effector that uses multiple axis of control. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the apparatus of Tabata et al. to not only use an end effector as taught by Ueyama et al. but to use a multiple degree of motion end effector as taught by Corwin, Jr. et al. because there may be times when the end effector must move in a variety of direction to operate properly.

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2. Claims 44, 45 and 48 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

It is argued that adding an end effector to the primary reference “Tabata et al.” would not meet the claim limitation of moving an end effector in a straight line. This is disagreed with. Ueyama et al. discloses in figure 14 an end effector that moves in a line, maintains its orientation, and does not move in a radial direction. This teaching combined with that of Tabata et al. who teaches that one moves a joint end linearly, together meet the claim limitation of moving two links and an end effector in a straight non radial line. The statement that the end effector in Ueyama et al. only moves in a radial direction is incorrect. In fig 14 the base axis of the two linkages in Ueyama et al. is the end portion 143. The movement of the end effector does not occur in a direction which only changes radius length but translates the end effector in the E2 direction. If the arms moved in a radially contracting direction the end effector would hit the side 131.

It is argued that Herzog does not disclose double linkages in the plural actuators used to position the end effector. This is agreed with. Herzog is relied upon to teach using two actuators to position the end effector. This in combination with the teachings of Tabata et al. which teaches using dual linkages in a single actuator. The combination of these teachings disclose dual double linked actuators.

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It is argued the robotic end effector of Corwin, Jr. et al. is non-analogous art because it does not lift wafers. This is disagreed with. Corwin, Jr. et al. teaches the end effector may be a variety of tools such as a gripper tongs. So Corwin teaches an end effector which grabs devices and moves them around. While this is not the same end effector this is analogous to the end effectors which reach under and lift so the Corwin reference is relevant for what it teaches. It is noted Ueyama et al. teaches an end effector of the wafer transport type.

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian Sircus whose telephone number is (703) 308-3119, Monday through Thursday between 8:30 and 5:00.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-1782.

The group fax number is (703) 305-3431 or -3432. Please identify the application number, the examiner, the art unit and a telephone number by which you may be reached on the cover page when sending a fax.

If necessary the examiner's supervisor, William Shoop, may be reached at (703) 308-3103.



Brian Sircus
Primary Examiner
February 27, 1999